



CARBON CREDITS IN BENEFIT OF ANDEAN SOLAR VILLAGES

PROJECT'S AIM: USING CARBON CREDITS TO MAKE SOLAR APPLICATIONS AFFORDABLE AND THEREWITH IMPROVE THE STANDARDS OF LIVING IN LOCAL VILLAGES

Location:

Province of Jujuy, Argentina

Technology:

Photovoltaic Systems

Solar Thermal

Parabolic solar

Costs:

Total: € 51,810

Participation of WISONS: € 46,629

CO₂ Reduction:

190,000 kg CO₂/year

Partners Involved:

Fundación EcoAndina

(www.ecoandina.org)

PIRCA (Proyecto de Integración y rescate de la Cultura Andina)

CAMBIAR (Centro Ambiental Argentino)

Enveco GmbH (Münster, Germany)

Duration:

02/2007 – 06/2009

Picture: EcoAndina

The remote Andean area in the Argentine-Chile-Bolivia triangle, also referred to as Puna, is one of most indigent parts of the region. The majority of people have no access to sustainable, clean, and affordable energy sources. The main energy source is biomass collected from the sparsely vegetated high plateau. This reliance on biomass causes serious environmental problems such as desertification, erosion and biodiversity losses.

Aware of this problematic situation a national initiative financed by the World Bank has introduced solar technologies to several villages in the region. In these "Solar Andean Villages" solar applications are regarded as a proven technology and are well accepted by the local population. But unfortunately the technology is not affordable for most families without any form of financial aid.

Fundación EcoAndina together with several partners therefore initiated this project aiming to establish sustainable financing for solar applications in the rural villages. The project strategy was to use carbon credits as a source of finance.

Linking the global carbon market to small local projects is still challenging as special know how is needed and the correct determination of emission reductions is often complicated. The major activities during the project were the development and testing of a measuring device and attaining and transferring know how on handling the complex carbon market opportunities.

At the start of the project families who were interested in buying solar cookers with the promise of receiving annual revenues were identified. Following 40 solar cookers were installed and equipped with

the new measuring device. The data collected over time was then used to develop a baseline study to determine the amount of CO₂ emission savings.

Initially the project design encompassed only a simulation of carbon market transaction. But during the project implementation the carbon market a company offered to sell the generated carbon credits on the voluntary market for greenhouse gas reduction certificates. Therefore an official validation and verification of the emission reductions (VERs) had to be performed. The results of this process can serve as a basis for the future dissemination and replication of the concept.

TECHNOLOGY, OPERATIONS AND MAINTENANCE

Two technologies were implemented during

the project: solar cookers and a monitoring device called SolCoDat. While solar cookers were already known in the region and technical viability had been proven, the SolCoDat device was a newly developed technology. SolCoDat was designed to measure the direct insolation to solar cookers. So the energy input to each individual solar cooker and daily using hours could be derived. The collected data was used to measure and verify the emission reductions attained with the solar cookers.

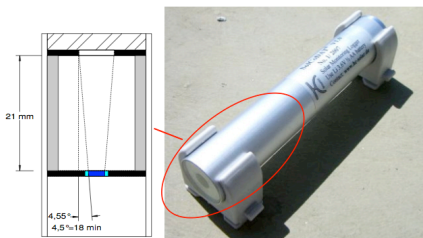


Figure 1: Principle of operation and picture of SolCoDat

Implementing the SolCoDat device multiple difficulties occurred and had to be dealt with. Among others, problems occurred during the read out of the devices on site, and the reset of the devices. Also some devices collected incorrect data and time. Furthermore the high variation of air temperature caused problems for the batteries as well as the devices itself. But continuous field tests helped to identify the wide scope of technical problems and allowed a continued improvement process. By the end of the project the monitoring technology could be considered as viable and appropriate to serve as a base for monitoring activities.

FINANCIAL ISSUES AND MANAGEMENT

The families who wanted to buy a solar cooker were offered a rate paying system. The main difference to former projects in the region was the promise of bonus back payments from carbon credits (as high as 15-20€ a year) in order to make the solar cookers affordable for potential clients. During the project term, a total of 40 solar cookers were sold to the target group instead of the planned amount of 50 solar cookers. This was due to the fact that the carbon credit back payments were only based on a promise. The measurements as

well as the paper work and verification of the carbon credits were done by the project team. They also managed the profits from selling the carbon credits to the company called GreenStream, who offered the generated carbon credits on the voluntary market for greenhouse gas reduction certificates. These profits were distributed to the families who purchased a solar cooker. During the project duration each user received three pay-outs of ca. 8€ regardless of individual use of the solar cooker. Once several payouts were performed and the project gained a certain public attention the project team faced a rather sudden increase in solar cooker demand. This was a promising sign for future expansion and dissemination of the project concept.

ENVIRONMENTAL ISSUES

The introduction of solar cookers helped to reduce CO₂ emissions and to decrease the demand of fuel wood in the participating families. In average 3.8 t CO₂/y for one Solar Cooker can be saved. In total 190 t CO₂ and 200 t of biomass annually can be saved due to the project activity. Switching to more sustainable energy sources is an important step to fight desertification and reduce the risks of erosion and loss of biodiversity in project area.

SOCIAL ISSUES

The project helped to reduce energy poverty by providing access to affordable and clean energy sources. In addition women and children in the participating families were partly freed from the burden of collecting fuel wood. Furthermore training and employment for two local citizens was provided within the scope of the project. The assigned tasks for those persons are to offer monitoring, service, and maintenance to the buyers of solar cookers.

RESULTS & IMPACT

The project demonstrated how renewable energy projects in developing countries could be financed by carbon credits. Solar cookers were made affordable to the local

population and at the same time the technology became economically feasible. The 40 families who now own a solar cooker benefit from the access to clean and sustainable energy for cooking purposes.

REPLICABILITY

The project design and technology have a high potential of replication. Technically the concept could be applied to regions that lack access to modern energy services and have a suitable level of solar insolation. Economically, the linkage of the global carbon market to regional markets for solar power systems offers a solution to the reoccurring problems of making renewable energy technology affordable and economically feasible.

LESSONS LEARNED

During the project several difficulties occurred. At first it proved to be hard to gain the potential user's trust. Then the timeframe did not take into consideration that the families would be absent during the raining season between January and March. No measurements could be conducted during this time. Also the SolCoDat device itself caused unexpected tooting problems. Therefore the concept of individual use dependent bonuses had to be transformed in payouts regardless of individual uses of the solar cooker.

Source: Final Report submitted to WISIONS by Fundación EcoAndina



Picture: EcoAndina